Introduction of digital TV in Bosnia and Herzegovina - Support for Public Broadcasting System

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Why DTV?

- More space in the frequency spectrum,
- Faster access to new technologies
- Lower prices for communication services,
- Frequency spectrum use of:
  - mobile telephones,
  - wireless internet access,
  - broadcasting services.
- Introduce new and competetive services,
- Higest quality,

Why DTV?

- Increased number of radio and TV channels
- More channels in the same frequency range
- Far-reaching effect on mass communications
- Completely change an improve and delivery of television and interactive services
- New business oppprtunites and broadband telecommunication services for broadcasters cable operators, telecommunication operators, etc.

Key Differences in Switchover Process between Western and Eastern Europe

- Eastern countries are launching later
- Eastern countries are tending to adopt more advanced compression technology
  - MPEG-4 resulting in higher costs;
- Eastern countries are planning the introduction of commercial business models (pay TV), resulting in increased costs for end users. The reasons for this are primarily financial, considering the lack of direct and indirect funds;

Key Differences in Switchover Process between Western and Eastern Europe

- Per capita GDP levels are lower in Eastern Eurpean countries, having eventually the negative impact on end users in the sense of purchase power for STB and integrated digital receivers;
- Public Broadcasting services in Eastern Europe are much more dependent on public funds than is the case in Western Europe;
- Commercial Pan-European networks dominate free-to-air television in Eastern Europe.

The data on the timeframe for drafting legislation and launch of digital broadcasting systems in European countries

Country	Full launch	ASO type	ASO approach	First ASO	Last ASO
UK	October 2002	target	regional	2008	December 2012
Sweden	September 1999	firm	regional	September 2005	February 2008
Spain	November 2005	target	regional	December 2007	April 2010
Finland	October 2002	firm	national	December 2006	December 2006
Netherlands	April 2003	government fiat	national	2007	2007
Germany	May 2004	target	regional	August 2003	2010
Italy	January 2004	target	regional	January 2006	December 2006
France	December 2005	target	regional	2007	March 2010
Switzerland		government fiat	regional	2007	2009
Belgium		government fiat	regional	2010	2010
Austria	2007	target	regional	mid 2007	2010
Norway	2006	firm	fast regional	2007	2009
Denmark	2007	firm	national	2011	2011
Ireland	2007				2010
Portugal	2007				2012
Greece	NA				2015

The basic data on digital broadcasting services launch in Eastern Europe

Country	MPEG type	Business model	Soft launch	Full launch	Switch-off date
Estonia	MPEG-4	pay	December 2006	2006	2012
Lithuania	MPEG-4	pay	July 2006	2007	2015
Czech Republic	MPEG-2	free-to-air	October 2005	2007	2012
Poland	unclear	unclear	2008	2008	2014
Hungary	unclear	unclear	2008	2008	2012
Slovakia	unclear	unclear	2008	2008	2012
Slovenia	MPEG-4	pay	March 2007	2008	2012
Latvia	MPEG-4	free-to-air	2007	2008	2011
Romania	unclear	unclear	2008	2009	unclear
Bulgaria	unclear	unclear	2008	2009	unclear

BiH case

- Current state of affairs:
  - Broadcasting sector policy;
  - On-going activities on development of strategy for introduction of digital broadcasting carried out through DTT forum;
  - International agreement GE06 and its ratification;
  - Development of regulatory framework;

BiH case

- Activities of the Commission for digitalization process monitoring – Report to BiH Council of ministers - analysis of possible solutions for digitalization of PBS BiH transmitting system:
  - Identified problems;
  - Recommended solutions;

Broadcasting Sector Policy in BiH

- Policy adopted in March 2007
- Confirms BiH determination to introduce digital TV
- Affirms obligations of BiH Council of Ministers, entity governments, PBS BiH and Communications Regulatory Agency
- Recognize function and affirms tasks of DTT forum

Activities on development of digital broadcasting strategy – DTT FORUM

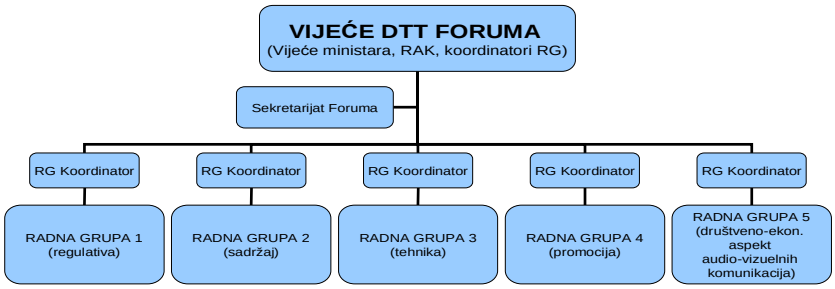
- Established on May 8, 2006 (following the conclusions and recommendations of the Conference "Introduction of digital TV in BiH" held in Sarajevo on March 30, 2006, as part of cooperation project between Communications Regulatory Agency and AGCOM Italy under the auspices of EU)

Activities on development of digital broadcasting strategy – DTT FORUM

- DTT Forum Tasks:
  - Development of strategy for introduction of digital broadcasting in BiH
  - Creation of necessary regulatory framework for digital broadcasting
  - Adoption of technical solutions of implementation of digital broadcasting
  - Definition of program content and services
  - Specification and provision of solutions related to economic effects of introduction of digital broadcasting
  - Promotion and presentation of digital broadcasting
  - Setting the timeline for digital switchover

Structure of DTT forum

BH DTT FORUM



- Coordinators of working groups are eminent expert from their respective fields

Digital Switchover Strategy

- Purpose of the Strategy:
  - Freedom, professionalism and independence of broadcast media
  - Prohibition of all forms of censorship or unlawful interfence in the work of the broadcast media
  - Balanced development of public and commercial broadcast services
  - Rational and efficient use of broadcasting frequencies as a limited natural resource,

Digital Switchover Strategy

- Purpose of the Strategy:
  - Free and equitable access of broadcasters to the telecommunication infrastructure for the purposes of broadcasting,
  - Development of competition and pluralism in broadcasting,
  - Application of international standards and principles ralating to broadcasting,
  - Objectivity, non-discrimination and transparency in allocating broadcasting frequencies.

Strategy Objectives

- Analogue switch-off non later than 31.12.2014 (target date).
- Set up a sustainable regulatory framework for prompt introduction of digital broadcasting, facilitation of the transition from analogue to digital broadcasting systems and their unobstructed development after the target date.
- For all public broadcasting services and existing holders of transmission and broadcasting licences envisage the possibility for free-to-air digitak distribution, and pay TV for other programme contents,

Strategy Objectives

- Until the target date provide the availability of digital broadcasting services to all citizens of BiH, ether by terrestrial transmission network (free-to-air), or by satellite digital broadcasting.
- Adopt solutions for the specification of transmission and reception equipment to enable the introduction of additional services such as HDTV etc.
- Enable unobstructed development of T-DAM and DRM systems,

Strategy Objectives

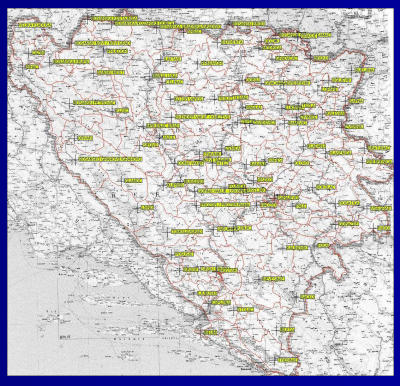
- During the switchover process, ensure efficient, objective and transparent planning, administration and management of broadcastting frequency spectrum,
- Increase the production both in terms of quantity and reduce transmission/distribution cost for public service broadcasters,
- Ensure a stimulating framework for creating added value sevices compared to the existing analogue broacasting systems for all stakeholders,
- Ensure efficient exercise and protection of copyright and related rights using the advantages offered in this field by digital techology.

International agreement GE06 and its ratification

- The new frequency spectrum plan for Europe, Africa and part of Asia has been in force since June 2007, as an international agreement.
- **Results:**
  - **7 networks at the state level for DVB-T in UHF band**
  - **1 network at the state level for DVB-T in VHF band**
  - **3 networks at the state level for T-DAB in VHF band**
  - **MFN network 1-2 multiplex for local coverage in larger settlements in BiH**
- **International agreement GE06 ratified in 2008**

International agreement GE06 and its ratification

BiH 7 + 1 SFN network (UHF and VHF)



MFN for local coverage

Development of regulatory framework

- Communications Regulatory Agency has anticipated licensing for the following:
  - License for "network operator" – licensee is responsible to build and maintain the infrastructure. License shall regulate the relationship between infrastructure owner and content and service provider
  - License for "service provider" – licensee is responsible for packaging different TV channels and other services provided for subscribers for appropriate subscription fee
  - License for "content provider" – licensee is the "editor" of the channel (producers of audiovisual content intended for broadcasting – in accordance with definition of audio-visual media – provided by EC Directive).

Development of regulatory framework

- Two new Rules are adopted:
  - The Rule on methods, terms and conditions for Audiovisual Media Service License
  - The Rule on methods, terms and conditions for RTV program distribution License

Activities of the Commission for digitalization process monitoring

- **Commission's findings:**
  - existing transmitting and broadcasting infrastructure is analogue and out of date, and not entirely in accordance with international and domestic regulations prescribing usage of radiofrequency spectrum.
  - full transformation of transmitting system of PBS BiH is needed in order to be in compliance with domestic and international regulations
  - licenses for third generation of mobile communications and operators of bandwidth access systems (WiMAX) shall not be issued before achieving digitalization of transmitting system of PBS BiH.
  - Full transformation of transmitting system of PBS BiH is needed to ensure that BiH meets its international obligations

Possible solutions

- Project of BiH Ministry for traffic and communications from 2006 (Project) annexed by the proposal for usage of digital rr links of PBS BiH from 2007, has been analyzed as a recommended solution for digitalization of transmitting system of PBS BiH, while ensuring autonomous system of digital rr links (as requested by PBS BiH)
- The project ensures possibility of parallel feed of analogue and future digital transmitters creating a solid foundation for digital switchover of PBS BiH, as displayed below:

Possible solutions

Table of accomplished territory and population coverage from initial locations linked with new rr transmitting system

Covered area	41.943 km2
Covered population	78.27%

Final conclusions

- Recommended technical concept is based on microwave rr links
- The project anticipates change of all existing rr links owned by three PBS services, which exclude all discovered malfunctions of existing infrastructure, expands network capacity, advances reliability of the system and enhances cost-effectiveness for system maintenance while simultaneously discarding all bands which are not harmonized with international and domestic regulations in the field of radiofrequency spectrum;

Final conclusions

- Recommended structure ensures unhindered broadcasting of analogue TV considering that planned transmitting system shall be used for feed of both analogue and digital transmitters at the same site;
- The dynamics of Project implementation shall be changed in order to reallocate all disputable rr links in bands of 2GHz and 3400-3800 MHz;
- As to the availability of radiofrequency resources, the Project envisages resolutions in several bands, with band 3,8-4,2 GHz being planned as the backbone of the system (rr links longer that 20m), while rr links of smaller capacity and shorter range are to be implemented in higher bands taking close care on optimal use of possible number of bands, to increase cost-effectiveness of network maintenance.

THANK YOU FOR ATTENTION!